

REMARKS

The Final Office Action mailed March 10, 2009 and the references cited therein have been carefully considered. Claims 1-17 are now pending in the application, although Claims 1-9 are withdrawn from consideration. No claim amendments are presented by this Response. Applicants respectfully request reconsideration of the pending rejections and the issues addressed below.

Claim Rejections under 35 USC § 103(a)

In the Office Action, Claims 10-14 and 16 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,251,318 to Arentsen et al. (**Arentsen**) in view of U.S. Patent No. 3,970,732 to Slaats et al. (**Slaats**). Also, Claims 15 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Arentsen in view of Slaats and further in view of U.S. Patent No. 5,059,376 to Pontiff et al. (**Pontiff**). The Office Action contends that the combination of Arentsen and Slaats or the combination of Arentsen, Slaats and Pontiff disclose all the features of the rejected claims. Applicant respectfully traverses these rejections.

Arentsen is cited in the Office Action for teaching a method of manufacturing biodegradable products by injecting polymers into a mold and heating the mold. **Slaats** is then cited because “Arentsen fails to teach the application of an overdose space in communication with the deaeration channel into which mass flows.” However, one of ordinary skill would not combine these two disclosures, as suggested in the Office Action, because there would not be a likelihood of success. What is more, even if one were to combine these patents, the combination would fail to meet all the limitations of the instant claims.

Arentsen discloses a method of manufacturing biodegradable products by introducing a mass including natural polymers under pressure into a mold and heating the mass therein in order to give rise to cross-linking of the polymers. The pressure and heat in the mold forces the mostly water-based blowing agents to escape from the mass and form bubbles. This creates a desired foamy structure, but also generates a very high expansion pressure within the mold. In Arentsen the blowing agent is activated by the heat and high pressure, thus there is no reason to add deaeration channels or vacuum pumps. There is no showing that it was known in the art that the addition of such things would improve the rate of foaming, as suggested in the subject Office Action.

In contrast, Slaats discloses a method where a plastic material is injected into the mold at sub-atmospheric pressure, and the differential pressure between the outside and inside holds the mold closed. That sub-atmospheric pressure causes the blowing agent to expand and form the foam structure. It is only after the foaming has completely filled the mold that the material is heated or cured (see Slaats, Col. 4, line 63 to Col. 5, line 10). If one of ordinary skill were to apply the method or natural polymers of Arentsen in the low pressure mold of Slaats, either the Arentsen polymers would not expand or the Slaats mold would explode. The Arentsen polymers require heat (150° C – 250° C) and high pressure for the cross-linking of the polymer to occur (see Arentsen Col. 11, line 61 to Col. 12, line 10). Also, it is specifically noted in Slaats, that the mold is held closed merely by the sub atmospheric pressure maintained therein. Slaats, is not concerned with high internal pressures because the materials used do not require heating above the gelatinization temperatures of the material and the gas bubbles that are formed are at relatively low pressure (see Slaats, Col. 5, lines 17-32). In contrast, the mold parts in Arentsen are clamped together due to the

high pressures involved (see Arentsen, Col. 11, line 50 to Col. 12 line 13). Thus, one of ordinary skill would have no reason to combine these two disclosures as there is no likelihood of success.

In fact, the two methods and materials used between them are so different, that it is unclear how one of ordinary skill would even attempt to combine the two. Arentsen uses strongly heated water to form bubbles in the batter, while Slaats uses Freon in liquid form as a blowing agent. These materials are not interchangeable and the same reduction in pressure used by Slaats for liquid Freon will not have the same effect on moisture contained within a polymer (i.e., will not cause the needed cross-linking). It is respectfully noted that Applicant's own invention should not be used as a roadmap to assemble prior art references using hindsight. The Office Action proposes at page 4 that adding "overdose recesses and vacuum pumps" would "improve the rate of foaming while reducing the deformation and warping of the article and maintain uniformity by reducing the temperature at which the blowing agent activates." But how would you know this without Applicant's disclosure? It has not been demonstrated that the disclosure of Slaats can be applied to or combined with the materials or mold methods of Arentsen.

In the present invention the mixture is injected into a closed mold, in which the pressure will increase very rapidly because of the water in the mixture heating to a temperature and pressure causing it to evaporate and act as a blowing agent. The increased pressure and temperatures accelerate the cross-linking of the natural polymers. Thereafter, the pressure in the overdose and deaeration channels is reduced allowing the water vapor to escape with the foam filling the mold cavity rapidly. Because the blowing agent in the present invention is not necessarily activated by

the reduced pressure, the blowing agent can be activated while the mold cavity is filling, but then the pressure reduced when the mold is substantially filled.

In further contrast, in Slaats the blowing agent is not activated because of heating and the reduced pressure has nothing to do with a boiling point thereof. The inside of the mold is either brought to sub atmospheric pressure while the mold cavity is filled or before, but not both. In contrast, Claim 10 recites that “a blowing agent is activated while the mold cavity is filled” as well as that the pressure inside the mold is reduced, “when the mold is substantially filled”. In Slaats, the blowing agent could not have been activated while the mold cavity is filled unless the pressure was already reduced, thus there would be no further need to reduce the pressure after the cavity was filled. A method that at first heats at least part of the blowing agent and then reduces the pressure in the mold is simply not disclosed or suggested by the prior art. Thus, the combination of Arentsen and Slaats fails to meet all the limitations of the claims.

Further, in Slaats the pressure in the deaeration channel or the overdose space will always be the same and the boiling point of the blowing agent is never changed or effected. In contrast, Claims 11 and 12 recites that a reduced pressure in the mold cavity is generated such that the boiling point of the blowing agent is increased/reduced. These elements are neither taught or reasonably disclosed by the prior art. Thus, the combination of Arentsen and Slaats fails to meet all the limitations of the claims.

Further still, the Office Action opines that Arentsen discloses “multiple deaeration channels” that this disclosure meets the limitations of Claims 13 and 14. However, Arentsen would not have multiple deaeration channels if somehow combined with Slaats as suggested by the Examiner. In

Arentsen multiple deaeration channels are provided to vent moisture. However, such channels 37 would not work in combination with Slaats source of suction 38, they would work contrary to one another. What is more, Slaats does not disclose using multiple suction sources. Thus, these elements are neither taught or reasonably disclosed by the prior art. Thus, the combination of Arentsen and Slaats fails to meet all the limitations of the claims.

With regard to Claim 16, the Office Action once again mixes references to Slaats and Arentsen but fails to specify which materials are being used and how the methods of both disclosures would work on either sets of materials. Slaats materials would not form cross-linking of polymers and Arentsen doesn't disclose curing materials in an overdose space.

Applicant therefore requests reconsideration of withdrawal of the rejections under 35 U.S.C. 103(a) based on any combination of Arentsen, Slaats or Pontiff.

Conclusion

Accordingly, favorable reconsideration of Claims 10-17 are hereby solicited. In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested.

If the Examiner has any questions or suggestions to expedite allowance of this application, he is cordially invited to contact Applicant's attorney at the telephone number provided.

Respectfully submitted,

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